

Imaging Density Disturbances in Water with a 41.3-Attosecond Time Resolution

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This work demonstrated that inelastic x-ray scattering may be exploited to invert its loss function, allowing real time imaging of density disturbances in a medium on incredibly short time scales. Shown schematically at right, the disturbance arising from a photoelectron ejected from liquid water with a time resolution of 41.3 attoseconds (4.13×10^{-17} sec) and spatial resolution of 1.27 Angstroms. The method suggests a way to probe the structural dynamics of photochemical reactions on time scales that have been hitherto inaccessible.

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